Philosophy of Mine Escape

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The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

Mine escape research

- **Interviews with 48 miners**
- **Each escaped one of three different mine fires**
- **Each discussed their experiences during escape**
- **Escape situations varied in complexity**
- **Some escaped with little difficulty**
- **Some encountered complicated escape scenarios**

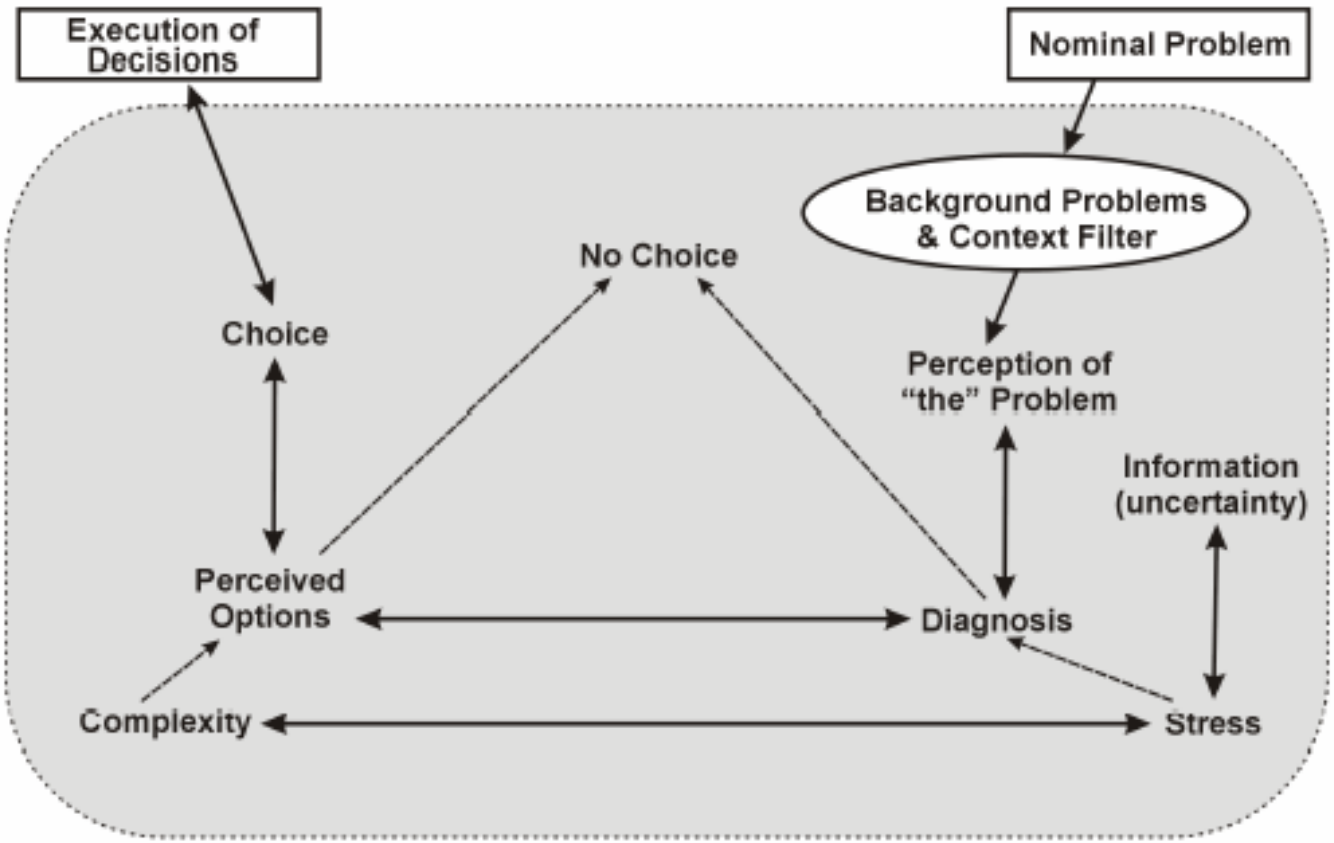
Profile of the Workers

- **Eight groups (3-10)**
- **Average age (42)**
- **Years in mining (17)**
- **Years at mine (15)**

Interviews with miners -

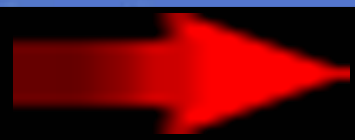
- Conducted privately with each miner
- 45 minutes to two hours
- Sessions audio taped and transcribed
- More than 2000 total pages of testimony
- Text analyzed for numerous themes discussed by escapees

Judgment and decision making process



Judgment and decision making process

- People tend to perceive the problem inadequately at first.
- Their diagnosis is affected by the nature of the warning message they receive.
- Workers perceived options and choices are impacted most by their knowledge of the mine and quality of information.
- The quality of leadership affected decision making.
- Actions (in hindsight) of escapees varied in quality.

Observations 

Judgment and decision making process and escape group behavior

- Workers will form a group.
- Most will actively engage in the judgment and decision making process.
- Individuals will usually go along regardless of personal opinion.
- Miners will take risks to assist each other.
- Leaders will emerge during an escape event.

Recommendations from the analysis of groups

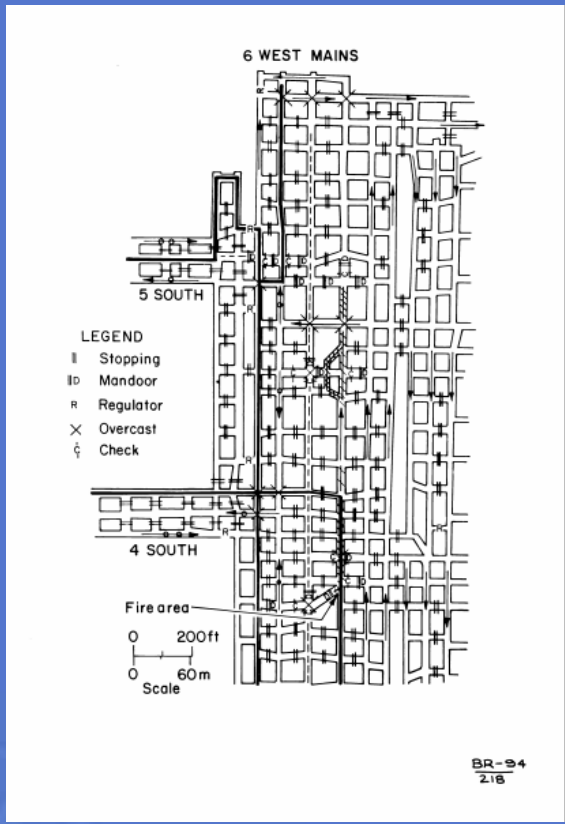
- Be aware of the time element involved in gathering and problem discussion.
- Discuss issues related to remaining together versus splitting the group.
- Prepare for the helping behavior that will undoubtedly occur if anyone has problems.
- Identify individuals who exhibit leadership qualities.

Judgment and decision making in escaping a mine fire

- Background problems
  - Smoke-filled entries
  - Toxic atmosphere
  - Problems wearing SCSRs
  - Leadership breakdowns
- Context filters
  - Track crew installing bonds
  - Hot roller along the belt
- Information uncertainty
  - No knowledge of fire location
- Stress from
  - First time in smoke
  - Not knowing how far to travel to safety
  - Limited knowledge of escapeways
  - Limited visibility
  - Smoke in unanticipated locations

Decisions made by escaping miners

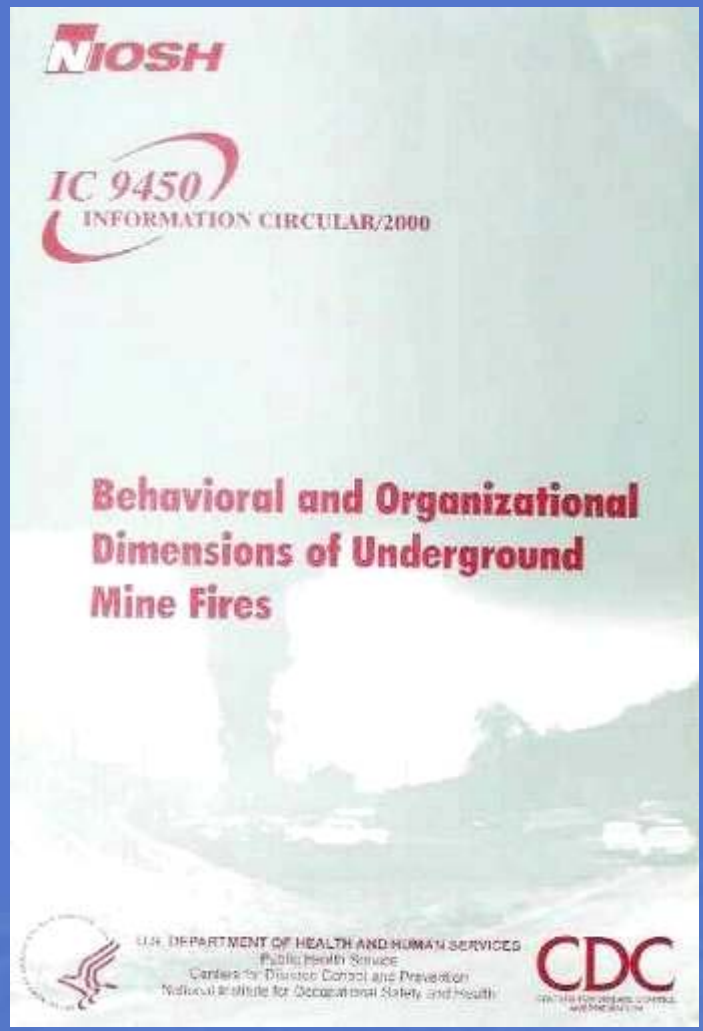
- Who should lead the group
- How to go out
  - Riding out
  - Walk out
- What route to take
  - Haulage track
  - Escapeways
  - Belt line
  - Return airways
- When to don SCSRs
- Split up the escape group
- Whether to leave a disabled miner behind



Conclusions

- Teach critical judgment and decision making skills.
- Train miners to know their escapeways.
- Conduct smoke training for miners.
- Train miners in communication skills.
- Identify potential leaders.

More information



http://www.cdc.gov/niosh/mining/pubs/pubreference/ic9450.htm